California Regional Health Information Organization

Data Standards Roadmap Recommendations for Health Information Exchange

To enable caregivers to easily share and use vital patient information, clinical data must conform to a set of rules or data standards. Standardized communication is the cornerstone of interoperability.

At the request of California stakeholders, CalRHIO has developed a list, or roadmap, representing where we believe standards for health information exchange will evolve. While it will take many years for all data users, providers, and vendors to adopt the recommended standards, the roadmap is intended to help organizations travel in the same direction. The roadmap provides a guide for California health care organizations as they purchase new or upgrade current information technology. It is also intended to assist health IT vendors in upgrading and developing products. The recommendations will be updated as new agreements evolve from national and CalRHIO efforts.

In preparing the roadmap, CalRHIO compiled the messaging, terminology, and document standards currently used in California. A short list was created, which aligns with national efforts. The short list of standards was evaluated to determine the evolution of functionality, compatibility, comprehensiveness, and suitability of the standards for data exchange. Ravi Nemana, the Health Technology Center's information technology advisor, managed the project; the roadmap was reviewed and approved by members of CalRHIO's Technology Working Group.

The data standards recommendations build on the work of the Office of the National Coordinator (ONC), the Consolidated Health Informatics (CHI) initiative, the Markle Foundation, the Certification Commission for Healthcare Information Technology (CCHIT), the Health Information and Management Systems Society (HIMSS), Health Level Seven (HL7), and the California HealthCare Foundation, especially their work on CALINX and EHR-Lab Interoperability and Connectivity Standards (ELINCS) project.

CalRHIO strongly recommends the use of Implementation Guides to assure interoperability. Implementation Guides are detailed instructions to maintain consistency of implementation within uses of the same version of a standard. Specifically recommended are CHI Implementation Guides to align with the federal portfolio of adopted standards for clinical information and CHCF's ELINCS and CALINX Implementation Guides for laboratory reporting.

Key Areas for Data Exchange	Future Standard	Description
Admin & Financial	**ASC X12 HIPAA**	Accredited Standards Committee X12 group is an American National Standards Institute or ANSI-accredited group that defines Electronic Data Interchange (EDI) standards for many American industries, including health insurance. The Health Insurance Portability and Accountability Act (HIPAA) of 1996 endorses X12N, along with other standards, as the mechanism for EDI used in administrative and financial health care transactions (excluding retail pharmacy transactions). HIPAA's rules are widely adopted for information exchange. www.x12.org
Allergies	**None**	No widely adopted standards exist for allergy codification. Area requires development.
Clinical Documentation	**HL7 v3.x**	Health Level Seven publishes application protocols for Electronic Data Exchange in health care. Version 2.x is widely deployed, but poses interoperability problems. Version 3.0 (now being used abroad) addresses many of these issues and offers flexibility, testability, and rigor. Version 3.x will include the refinements based on the international usage experience of Version 3.0. www.hl7.org
	CDA	Clinical Data Architecture (formerly the Patient Record Architecture) provides an exchange model for clinical documents (such as discharge summaries and progress notes). CDA was approved as an ANSI Standard in November 2000. The CDA makes documents both machine- and human-readable. CDA documents can be displayed using XML-aware Web browsers or wireless applications such as cell phones. www.ansi.org
	CCR	The Clinical Care Document (CCD) is an HL7 CDA containing the American Society for Testing and Materials (ASTM) Continuity of Care Record (CCR). CCR is ASTM's active standard in response to the need to organize and make transportable the most relevant and timely facts about a patient's condition. Briefly, the CCR includes patient and provider information, insurance information, patient's health status (e.g., allergies, medications, vital signs, diagnoses, recent procedures), recent care provided, future care (care plan) recommendations, and the reason for referral or transfer. www.astm.org

Imaging	**DICOM for all imaging**	Digital Imaging and Communications in Medicine was created by the National Electrical Manufacturers Association (NEMA) to aid the distribution and viewing of medical images such as CT scans, MRIs, and ultrasound. Originally used for radiology, many other specialty disease societies have adopted this standard. medical.nema.org
Immunization	**HL7 v3.x**	See HL7 description above.
Laboratory	**ELINCS**	The EHR-Lab Interoperability and Connectivity Standards (ELINCS) project is developing a national standard for the delivery of real-time laboratory results from a lab's information system to an ambulatory electronic health record. ELINCS is an implementation of HL7 Version 2.4 messaging that upgrades CALINX4 with real-time processing for lab communications. Note: HL7 Version 2.4 lab specifications do not support specimens and specimen management or blood banking. These are detailed in HL7 Version 2.5. Lab public health reporting is included in HL7 Version 2.6 and this public health reporting is required by American Health Information Community (AHIC) for interoperability on the National Health Information Network (NHIN). www.chcf.org
	HL7 v3.x	See HL7 description above.
Medication	**HL7 v3.x (mapped)**	See HL7 description above.
	ePrescribing	ePrescribing is detailed in the Health Insurance Portability and Accountability Act (HIPAA) of 1996.
	NCPDP	National Council for Prescription Drug Programs issues standards for the exchange of prescription-related information that facilitate online prescribing and other pharmacy-related processes. www.ncpdp.org
	NCPDP, CALINX Rx	NCPDP has adopted CALINX Rx for its post-adjudication standard.

Services	**HL7 (OMG)**	Object Management Group (OMG) and HL7 (see above) are collaborating to build a set of standard health care-domain software components and service interface standards to promote open interoperability across health provider organizations and products. This is an area of future development for standards to ensure interoperability of systems.
Vocabulary	**SNOMED CT**	Systematized Nomenclature of Medicine Clinical Terms focuses on standardizing terminology across clinical specialties and sites of care and developing standards in response to the increasing need to document care in a computer-readable format; reliably and reproducibly retrieve and aggregate patient level and population-based data; and transmit data in electronic format. The U.S. government has obtained a free license for the public for the use of SNOMED. SNOMED is an adopted standard in CHI for laboratory results, non-laboratory interventions and procedures, and all diagnoses, problems, nursing, and anatomy. www.snomed.org
	ICD-9-CM	International Classification of Diseases, Clinical Modification, is published by the World Health Organization. ICD-9-CM is a federally accepted standard for morbidity and mortality coding. The 9th revision is used exclusively in the U.S. and the 10th revision is currently being reviewed.
	LOINC	The Laboratory Logical Observation Identifiers Names and Codes database is used for laboratory coding. It contains the usual categories of chemistry, hematology, serology, microbiology, and toxicology, as well as categories for drugs and cell counts found on a complete blood count or a cerebrospinal fluid cell count. Laboratory LOINC is published by Regenstrief Institute and is an adopted standard in CHI for laboratory procedures and structured labeling of medications. www.regenstrief.org/loinc
	CPT-5	Current Procedure Terminology codes, published by the AMA, are now in their 5th version. CPT is part of the code set standard selected by HIPAA to describe health care services in electronic transactions, largely for charge capture. www.ama-assn.org

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